



|   |  |                                      |                                   |
|---|--|--------------------------------------|-----------------------------------|
| <b>INFORMATION DISCLOSURE<br/>STATEMENT<br/>BY APPLICANT</b><br>(Use several sheets if necessary) |  | Docket Number:<br>ACE-00101.P.1.1-US | Application Number:<br>10/705,447 |
|   |  | Applicant:<br>Xiao Xu                |                                   |
|   |  | Filing Date:<br>November 10, 2003    | Group Art Unit:<br>1632           |

| U. S. PATENT DOCUMENTS |     |                    |         |                  |       |               |                                  |
|------------------------|-----|--------------------|---------|------------------|-------|---------------|----------------------------------|
| EXAMINER<br>INITIAL    |     | DOCUMENT<br>NUMBER | DATE    | NAME             | CLASS | SUB-<br>CLASS | FILING DATE<br>IF<br>APPROPRIATE |
| NAB                    | P1  | 2003/0032000       | 02/2003 | Liu et al        | X     |               |                                  |
|                        | P2  | 2005/0014130       | 01/2005 | Liu et al        |       |               |                                  |
|                        | P3  | USRE38,323         | 11/2003 | Sugihara et al   |       |               |                                  |
|                        | P4  | 6,368,795          | 04/2002 | Hefti            |       |               |                                  |
|                        | P5  | 6,376,233          | 04/2002 | Wolf et al       |       |               |                                  |
|                        | P6  | 6,461,808          | 10/2002 | Bodner et al     |       |               |                                  |
|                        | P7  | 6,485,905          | 11/2002 | Hefti            |       |               |                                  |
|                        | P8  | 6,566,079          | 05/2003 | Hefti            |       |               |                                  |
|                        | P9  | 6,573,063          | 03/2003 | Hochman          |       |               |                                  |
|                        | P10 | 6,626,902          | 09/2003 | Kucharczyk et al |       |               |                                  |
|                        | P11 | 6,627,461          | 09/2003 | Chapman et al    |       |               |                                  |
|                        | P12 | 6,686,193          | 02/2004 | Maher et al      |       |               |                                  |
| NAB                    | P13 | 6,716,620          | 04/2004 | Bashir et al     |       |               |                                  |

|                       |                 |                    |            |
|-----------------------|-----------------|--------------------|------------|
| Examiner<br>Signature | /Nathan Bowers/ | Date<br>Considered | 10/20/2006 |
|-----------------------|-----------------|--------------------|------------|

| FOREIGN PATENT DOCUMENTS |    |                    |         |         |       |               |             |    |
|--------------------------|----|--------------------|---------|---------|-------|---------------|-------------|----|
| EXAMINER<br>INITIAL      |    | DOCUMENT<br>NUMBER | DATE    | COUNTRY | CLASS | SUB-<br>CLASS | Translation |    |
|                          |    |                    |         |         |       |               | YES         | NO |
| NAB                      | F1 | EP<br>1195432B1    | 09/2004 | EPO     | X     | X             | X           | X  |
|                          | F2 | 01/25769           | 04/2001 | PCT     |       |               |             |    |
|                          | F3 | 02/04943           | 01/2002 | PCT     |       |               |             |    |
|                          | F4 | 02/42766           | 05/2002 | PCT     |       |               |             |    |
|                          | F5 | 03/016887          | 02/2003 | PCT     |       |               |             |    |
| NAB                      | F6 | 05/005979          | 01/2005 | PCT     |       |               |             |    |

| OTHER DOCUMENTS<br>(Including Author, Date, Pertinent Pages, Etc.) |    |   |
|--|----|---|
| EXAMINER<br>INITIALS   |    | CITATION  |
| NAB  | D1 | Bieberich and Guiseppi-Elie, Biosensors and Bioelectronics, 19:923-931 (2004) |
|  | D2 | Burnett et al., J. Biomo. Screening, 8(6):660-667 (2003)                      |
|  | D3 | Ciambrone et al., J. Biomo. Screening, 9(6):467-480 (2004)                    |
|  | D4 | Ehret et al., Med. Biol. Eng. Comput. 36:365-370 (1998)                       |
|  | D5 | Ehret et al., Biosensors and Bioelectronics, 12(1):29-41 (1996)               |
|  | D6 | Gutmann et al., Pharmaceutical Research, 16(3):402-407 (1999)                 |
| NAB  | D7 | Hug, Assay and Drug Dev. Tech., 1(3):479-488 (2003)                           |

|                       |                 |                    |            |
|-----------------------|-----------------|--------------------|------------|
| Examiner<br>Signature | /Nathan Bowers/ | Date<br>Considered | 10/20/2006 |
|-----------------------|-----------------|--------------------|------------|

| OTHER DOCUMENTS<br>(Including Author, Title, Date, Pertinent Pages, Etc.) |     |   |
|---|-----|---|
| EXAMINER<br>INITIALS  |     | CITATION  |
| NAB   | D8  | Lin and Huang, J. Micromech. Microeng., 11:542-547 (2001)     |
|   | D9  | Lin et al., Min. For Chem., Bio., & Bioeng., 4:104-108 (2004) |
|   | D10 | Wegener et al., Eur. J. Physiol., 437:925-934 (1999)          |
|   | D11 | Wolf et al., Biosensors and Bioelectronics, 13:501-509 (1998) |
|   | D12 | Xiao and Luong, Biotechnol. Prog., 19:1000-1005 (2003)        |
|   | D13 | Xiao et al., Anal. Chem., 74:5748-5753 (2002)                 |
|   | D14 | Yamauchi et al., Nuc. Acids Res., 32(22):1-8 (2004)           |
| NAB   | D15 | Loffert et al., QIAGENNews, 4:15-18 (1997)                    |

|                       |                 |                    |            |
|-----------------------|-----------------|--------------------|------------|
| Examiner<br>Signature | /Nathan Bowers/ | Date<br>Considered | 10/20/2006 |
|-----------------------|-----------------|--------------------|------------|



|   |                                      |                                   |
|---|--------------------------------------|-----------------------------------|
| <b>INFORMATION DISCLOSURE<br/>STATEMENT<br/>BY APPLICANT</b><br>(Use several sheets if necessary) | Docket Number:<br>ACE-00101.P.1.1-US | Application Number:<br>10/705,447 |
|   | Applicant:<br>Xiao Xu                |                                   |
|   | Filing Date:<br>November 10, 2003    | Group Art Unit:<br>1632           |

| U.S. PATENT DOCUMENTS |     |                    |         |                  |       |               |                                  |
|-----------------------|-----|--------------------|---------|------------------|-------|---------------|----------------------------------|
| EXAMINER<br>INITIAL   |     | DOCUMENT<br>NUMBER | DATE    | NAME             | CLASS | SUB-<br>CLASS | FILING DATE<br>IF<br>APPROPRIATE |
| NAB                   | P1  | 2002/0032531       | 03/2002 | Mansky et al     |       |               |                                  |
|                       | P2  | 2002/0076690       | 06/2002 | Miles et al      |       |               |                                  |
|                       | P3  | 2002/0086280       | 07/2002 | Lynes et al      |       |               |                                  |
|                       | P4  | 2002/0110847       | 08/2002 | Baumann et<br>al |       |               |                                  |
|                       | P5  | 2002/0150886       | 10/2002 | Miles et al      |       |               |                                  |
|                       | P6  | 2,656,508          | 10/1953 | Coulter          |       |               |                                  |
|                       | P7  | 3,259,842          | 07/1966 | Coulter et<br>al |       |               |                                  |
|                       | P8  | 3,743,581          | 07/1973 | Cady et al       |       |               |                                  |
|                       | P9  | 3,890,201          | 06/1975 | Cady             |       |               |                                  |
|                       | P10 | 4,072,578          | 02/1978 | Cady et al       |       |               |                                  |
|                       | P11 | 4,225,410          | 09/1980 | Pace             |       |               |                                  |
|                       | P12 | 4,686,190          | 08/1987 | Cramer et al     |       |               |                                  |
|                       | P13 | 4,920,047          | 04/1990 | Giaever et<br>al |       |               |                                  |
|                       | P14 | 5,134,070          | 07/1992 | Casnig           |       |               |                                  |
|                       | P15 | 5,187,096          | 02/1993 | Giaever et<br>al |       |               |                                  |
|                       | P16 | 5,218,312          | 06/1993 | Moro             |       |               |                                  |
|                       | P17 | 5,278,048          | 01/1994 | Parce et al      |       |               |                                  |
| NAB                   | P18 | 5,284,753          | 02/1994 | Goodwin          |       |               |                                  |

|                       |                 |                    |            |
|-----------------------|-----------------|--------------------|------------|
| Examiner<br>Signature | /Nathan Bowers/ | Date<br>Considered | 10/20/2006 |
|-----------------------|-----------------|--------------------|------------|

| U.S. PATENT DOCUMENTS |     |                    |         |                   |       |               |                                  |
|-----------------------|-----|--------------------|---------|-------------------|-------|---------------|----------------------------------|
| EXAMINER<br>INITIAL   |     | DOCUMENT<br>NUMBER | DATE    | NAME              | CLASS | SUB-<br>CLASS | FILING DATE<br>IF<br>APPROPRIATE |
| NAB                   | P19 | 5,563,067          | 10/1996 | Sugihara et<br>al |       |               |                                  |
|                       | P20 | 5,626,734          | 05/1997 | Docoslis et<br>al |       |               |                                  |
|                       | P21 | 5,643,742          | 07/1997 | Malin et al       |       |               |                                  |
|                       | P22 | 5,801,055          | 09/1998 | Henderson         |       |               |                                  |
|                       | P23 | 5,810,725          | 10/1998 | Sugihara et<br>al |       |               |                                  |
|                       | P24 | 5,851,489          | 12/1998 | Wolf et al        |       |               |                                  |
|                       | P25 | 5,981,268          | 11/1999 | Kovacs et al      |       |               |                                  |
|                       | P26 | 6,051,422          | 04/2000 | Kovacs et al      |       |               |                                  |
|                       | P27 | 6,132,683          | 10/2000 | Sugihara et<br>al |       |               |                                  |
|                       | P28 | 6,169,394          | 01/2001 | Frazier et<br>al  |       |               |                                  |
|                       | P29 | 6,232,062          | 05/2001 | Kayyem et al      |       |               |                                  |
|                       | P30 | 6,235,520          | 05/2001 | Malin et al       |       |               |                                  |
|                       | P31 | 6,280,586          | 08/2001 | Wolf et al        |       |               |                                  |
|                       | P32 | 6,288,527          | 09/2001 | Sugihara et<br>al |       |               |                                  |
|                       | P33 | 6,368,851          | 04/2002 | Baumann et<br>al  |       |               |                                  |
|                       | P34 | 6,376,233          | 04/2002 | Wolf et al        |       |               |                                  |
|                       | P35 | 6,448,030          | 09/2002 | Rust et al        |       |               |                                  |
|                       | P36 | 6,448,794          | 09/2002 | Cheng et al       |       |               |                                  |
| NAB                   | P37 | 6,472,144          | 10/2002 | Malin et al       |       |               |                                  |
|                       | P38 |                    |         |                   |       |               |                                  |

|                       |                 |                    |            |
|-----------------------|-----------------|--------------------|------------|
| Examiner<br>Signature | /Nathan Bowers/ | Date<br>Considered | 10/20/2006 |
|-----------------------|-----------------|--------------------|------------|

| FOREIGN PATENT DOCUMENTS |    |                    |         |         |       |               |             |    |
|--------------------------|----|--------------------|---------|---------|-------|---------------|-------------|----|
| EXAMINER<br>INITIAL      |    | DOCUMENT<br>NUMBER | DATE    | COUNTRY | CLASS | SUB-<br>CLASS | Translation |    |
|                          |    |                    |         |         |       |               | YES         | NO |
| NAB                      | F1 | 96/01836           | 01/1996 | PCT     | X     |               |             |    |
|                          | F2 | 99/66329           | 12/1999 | PCT     |       |               |             |    |
|                          | F3 | 00/71669           | 11/2000 | PCT     |       |               |             |    |
|                          | F4 | 01/038873          | 05/2001 | PCT     |       |               |             |    |
| NAB                      | F5 | 02/42766           | 05/2002 | PCT     |       |               |             |    |
|                          | F6 |                    |         |         |       |               |             |    |

| OTHER DOCUMENTS<br>(Including Author, Title, Date, Pertinent Pages, Etc.) |    |   |
|---|----|---|
| EXAMINER<br>INITIALS  |    | CITATION  |
| NAB   | D1 | Aravanis et al. A genetically engineered cell-based biosensor for functional classification of agents. Biosensors & Bioelectronics 16:571-577 (2001)                          |
| NAB   | D2 | Baumann et al. Microelectronic sensor system for microphysiological application on living cells. Sensors & Actuators B55:77-89 (1999)   |
| NAB   | D3 | Becker et al, Separation of human breast cancer cells from blood by differential dielectric affinity. Cell Biology. 92:960-964 (1995)   |
| NAB   | D4 | Berens et al, The role of extracellular matrix in human astrocytoma migration and proliferation studied in a microliter scale assay. Clin. Exp. Metastasis 12:405-415 (1994)  |
| NAB   | D5 | Bergveld, A critical evaluation of direct electrical protein detection methods, Biosensors& Bioelectronics. 6:55-72 (1991)  |
| NAB   | D6 | Burns et al, Neutrophil Transendothelial Migration Is Independent of Tight Junctions and Occurs Preferentially at Tricellular Corners. Journal of Immunology 2893-2903 (1997) |

|                       |                 |                    |            |
|-----------------------|-----------------|--------------------|------------|
| Examiner<br>Signature | /Nathan Bowers/ | Date<br>Considered | 10/20/2006 |
|-----------------------|-----------------|--------------------|------------|

| OTHER DOCUMENTS<br>(Including Author, Title, Date, Pertinent Pages, Etc.) |     |   |
|---|-----|---|
| EXAMINER<br>INITIALS  |     | CITATION  |
| NAB   | D7  | Duan et al, Separation-Free Sandwich Enzyme Immunoassays Using Microporous Gold Electrodes and Self-Assembled Monolayer/Immobilized Capture Antibodies, Anal. Chem. 66:1369-1377 (1994) |
|   | D8  | Connolly et al., An extracellular microelectrode array for monitoring electrogenic cells in culture Biosensors & Bioelectronics 5: 223-234 (1990)                                       |
|   | D9  | Ehret et al, Monitoring of cellular behaviour by impedance measurements on interdigitated electrode structures. Biosensors and Bioelectronics 12(1):29-41 (1997)                        |
|   | D10 | Ehret et al, On-line control of cellular adhesion with impedance measurements using interdigitated electrode structures, Medical & Biological Engineering and Computing 36:365-370      |
|   | D11 | Falk et al, A 48-well Micro Chemotaxis Assembly for Rapid and Accurate Measurement of Leukocyte Migration. J Immunol. Meth. 33:239-247 (1980)   |
|   | D12 | Fuhr et al, Positioning and Manipulation of Cells and Microparticles Using Miniaturized Electric Field Traps and Travelling Waves. Sensors and Materials 7(2):131-146 (1995)            |
|   | D13 | Gaiever et al, Monitoring fibroblast behavior in tissue culture with an applied electric field. Proc. Natl. Acad. Sci 81:3761-3764 (1984)   |
|   | D14 | Giaever et al, Micromotion of mammalian cells measured electrically. Proc. Natl. Acad. USA 88: 7896-7900 (1991)   |
|   | D15 | Hadjout et al., Automated Real-Time Measurement of Chemotactic Cell Motility BioTechniques 31: 1130-1138 (2001)   |
|   | D16 | Henning et al, Approach to a multiparametric sensor-chip-based tumor chemosensitivity assay, Anti-Cancer Drugs 12:21-32 (2001)  |
|   | D17 | Hidalgo et al, Characterization of the Human Colon Carcinoma Cell Line (Caco-2) as a Model System for Intestinal Epithelial Permeability. Gastroenterology 96:736-749 (1989)            |
| NAB   | D18 | Huang et al., Dielectrophoretic Cell Separation and Gene Expression Profiling on Microelectronic Chip Arrays. Anal. Chem. 74:3362-3371 (2002)   |

|                       |                 |                    |            |
|-----------------------|-----------------|--------------------|------------|
| Examiner<br>Signature | /Nathan Bowers/ | Date<br>Considered | 10/20/2006 |
|-----------------------|-----------------|--------------------|------------|

| OTHER DOCUMENTS<br>(Including Author, Title, Date, Pertinent Pages, Etc.) |     |   |
|---|-----|---|
| EXAMINER<br>INITIALS  |     | CITATION  |
| NAB   | D19 | Keese et al, Real-time impedance assay to follow the invasive activities of metastatic cells in culture. Biotechniques 33:842-850 (2002)  |
|   | D20 | Kleinmann et al, Basement Membrane Complexes with Biological Activity. Biochemistry. 26:312-318 (1986)  |
|   | D21 | Kowolenko et al., Measurement of macrophage adherence and spreading with weak electric fields. Journal of Immunological Methods 127: 71-77 (1990)   |
|   | D22 | Larsen et al, Somatic Cell Counting with Silicon Apertures. Micro Total Analysis Systems 103-106 (2000)   |
|   | D23 | Lo et al, Monitoring motion of confluent cells in tissue culture, Experimental Cell Research 204:102-109 (1993)   |
|   | D24 | Lo et al., pH Changes in pulsed CO <sub>2</sub> incubators cause periodic changes in cell morphology Experimental Cell Research 213: 391-397 (1994)   |
|   | D25 | Lo et al., Impedance Analysis of MDCK cells measured by electric cell-substrate impedance sensing Biophysical Journal 69: 2800-2807 (1995)  |
|   | D26 | Luong, et al., Monitoring Motility, Spreading, and Mortality of Adherent Insect Cells Using an Impedance Sensor. Analytical Chemistry 73: 1844-1848 (2001)                                      |
|   | D27 | Mitra et al, Electric measurements can be used to monitor the attachment and spreading of cells in tissue culture. Biotechniques 11(4):504-510 (1991)   |
|   | D28 | Miyata et al, New Wound-Healing Model Using Cultured Corneal Endothelial Cells. Jpn. J. Ophthalmol. 34:257-266 (1990).  |
|   | D29 | Neher, Molecular biology meets microelectronics Nature Biotechnology 19: 114 (2001)   |
|   | D30 | Nerurkar et al, The Use of Surfactants to Enhance the Permeability of Peptides Through Caco-2 Cells by Inhibition of an Apically Polarized Efflux System. Pharmaceutical Research 13(4):528-534 |
| NAB   | D31 | Ong et al, Remote Query Resonant-Circuit Sensors For Monitoring of Bacterial Growth: Application to Food Quality Control. Sensors 2:219-222 (2002)  |

|                       |                 |                    |            |
|-----------------------|-----------------|--------------------|------------|
| Examiner<br>Signature | /Nathan Bowers/ | Date<br>Considered | 10/20/2006 |
|-----------------------|-----------------|--------------------|------------|



| OTHER DOCUMENTS<br>(Including Author, Title, Date, Pertinent Pages, Etc.) |     |  |
|---|-----|--|
| EXAMINER<br>INITIALS  |     | CITATION   |
| NAB   | D32 | Pancrazio et al, Portable cell-based biosensor system for toxin detection. Sensors and Actuators B 53:179-185 (1998)   |
|   | D33 | Patolsky et al, Detection of single-base DNA mutations by enzyme-amplified electronic transduction. Nature Biotechnology 19:253-257 (2001)   |
|   | D34 | Pethig et al, Positive and negative dielectrophoretic collection of colloidal particles using interdigitated castellated microelectrodes. Appl. Phys. 24:881-888 (1992)            |
|   | D35 | Richards et al, A Modified Microchamber Method For Chemotaxis and Chemokinesis. Immunological Communications 13(1):49-62 (1984)  |
|   | D36 | Rishpon et al, An amperometric enzyme-channeling immunosensor, Biosensors & Bioelectronics, 12(3):195-204 (1997)   |
|   | D37 | Simpson et al., Whole-cell biocomputing Trends in Biotechnology 19: 317-323 (2001)   |
|   | D38 | Sohn et al, Capacitance cytometry: Measuring biological cells one by one. Proc. Nat. Acad. Sci. 97(20)10687-10690 (2000)   |
|   | D39 | Stenger et al., Detection of physiologically active compounds using cell-based biosensors. Trends in Biotechnology 19: 304-309 (2001)  |
|   | D40 | Svetlicic et al., Charge displacement by adhesion and spreading of a cell Bioelectrochemistry 53: 79-86 (2000)   |
|   | D41 | Tiruppathi et al, Electrical method for detection of endothelial cell shape change in time: assessment of endothelial barrier function. Proc Natl Acad Sci USA 89:7919-7923 (1992) |
|   | D42 | Wang et al, A theoretical method of electrical field analysis for dielectrophoretic electrode arrays using Green's theorem. Appl. Phys. 1649-1660 (1996)                           |
|   | D43 | Wang et al, Selective dielectrophoretic confinement of bioparticles in potential energy wells. Appl. Phys. 26:1278-1285 (1993)   |
| NAB   | D44 | Wang et al, Cell Separation by Dielectrophoretic Field-flow-fractionation. Anal. Chem. 72:832-839 (2000)   |

|                       |                 |                    |            |
|-----------------------|-----------------|--------------------|------------|
| Examiner<br>Signature | /Nathan Bowers/ | Date<br>Considered | 10/20/2006 |
|-----------------------|-----------------|--------------------|------------|

| OTHER DOCUMENTS<br>(Including Author, Title, Date, Pertinent Pages, Etc.) |     |   |
|---|-----|---|
| EXAMINER<br>INITIALS  |     | CITATION  |
| NAB   | D45 | Wang et al, Dielectrophoretic Manipulation of Cells with Spiral Electrodes. Biophysical Journal 72:1887-1899 (1997)   |
|   | D46 | Wang et al, Separation of Polystyrene Microbeads Using Dielectrophoretic/Gravitational Field-Flow-Fractionation. Biophysical Journal 74:2689-2701 (1998)  |
|   | D47 | Wang et al., Electronic Manipulation of Cells on Microchip-Based Devices. In Biochip Technology (eds.) Harwood Academic Publishers, PA U.S.A. 135-159   |
|   | D48 | Warburg, Ueber die Polarisationscapacitat des Platins. Ann. Phy. 6:125-135 (1901)   |
|   | D49 | Wegener et al, Electric cell-substrate impedance sensing system (ECIS) as a noninvasive means to monitor the kinetics of cell spreading to artificial surfaces, Experimental Cell Research, 259:158-166 (2000)  |
|   | D50 | Wolf et al, Monitoring of cellular signalling and metabolism with modular sensor-technique: The PhysioControl0Microsystem (PCM). Biosensors & Bioelectronics 13:501-509 (1998)  |
|   | D51 | Xiao et al, An in-depth Analysis of Electric Cell-Substrate Impedance Sensing To Study the Attachment and Spreading of Mammalian Cells, Anal. Chem 74:1333-1339 (2002)  |
|   | D52 | Yang et al, Cell Separation on Microfabricated Electrodes Using Dielectrophoretic/Gravitational Field-Flow Fractionation. Anal. Chem. 71:911-918 (1999)   |
|   | D53 | <a href="http://www.neuroprobe.com/protocol/pt_96a.html">http://www.neuroprobe.com/protocol/pt_96a.html</a>   |
|   | D54 | <a href="http://www.bdbiosciences.com/discovery_labware/Products/inserts/BD_Falcon_HTS_fluoroblok_inserts/individual_fluoroblok_inserts/index.html">http://www.bdbiosciences.com/discovery_labware/Products/inserts/BD_Falcon_HTS_fluoroblok_inserts/individual_fluoroblok_inserts/index.html</a> |
|   | D55 | <a href="http://www.tecan.com/migration_introl.pdf">http://www.tecan.com/migration_introl.pdf</a>   |
|   | D56 | New Products page. Science 298:2409 (2002)  |
|   | D57 | Abstract: Real-Time Impedance Assay to Follow the Invasive Activities of Metastatic Cells in Culture. Biotechniques 33: 842 (2002)  |
| NAB   | D58 | <a href="http://www.biophysics.com/pages/front.html">http://www.biophysics.com/pages/front.html</a>   |
|   |     |   |

|                       |                 |                    |            |
|-----------------------|-----------------|--------------------|------------|
| Examiner<br>Signature | /Nathan Bowers/ | Date<br>Considered | 10/20/2006 |
|-----------------------|-----------------|--------------------|------------|